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REVISED SYSTEM OF NATIONAL ACCOUNTS

INTRODUCTION

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N O T E

The text of the introduction has not as yet been reviewed by members of the Inter-Secretairat Working Group on the SNA or Expert Group on SNA Coordination. This review will be carried out in light of the discussion in the Interregional Seminar on the Revision of the SNA to be held in Aguascalientes, Mexico.

I. INTRODUCTION

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I. INTRODUCTION

List of Acronyms

GDP . . . . . gross domestic product
NDP . . . . . net domestic product
NPI . . . . . non-profit institution

I. INTRODUCTION

A. The SNA as a System

1. The SNA consists of a consistent, coherent and integrated set of macro-economic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, conventions, classifications and accounting rules. It provides a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for purposes of economic analysis, decision taking and policy making. The SNA may be implemented at different levels of aggregation: at the level of individual economic agents, or institutional units as they are called in the System; for groups of such units, or sectors of the economy, or at the level of the total economy. Although traditionally described as a system of national accounts, for analytical purposes it has to be implemented at lower levels of aggregation; in order to be able to understand the working of the economy, it must be possible to observe and analyse the economic interactions taking place between the different sectors of the economy. Certain key aggregate statistics, such as Gross Domestic Product (GDP), that are widely used as indicators of economic activity at the level of the total economy, are defined within the System, but the calculation of such aggregates has long ceased to be the primary purpose for compiling national accounts.

2. The System consists of a sequence of inter-connected accounts linked to different types of economic activities taking place within a given period of time, together with balance sheets that record the values of the assets and liabilities held at the beginning and end of the period. Each account relates to a particular kind of activity such as production or the generation, distribution or redistribution of income. Each account is balanced by introducing a balancing item defined residually as the difference between the total resources and uses recorded on the two sides of the account. The balancing item from one account is carried forward as the first item in the following account, thereby making the sequence of accounts an articulated whole. The balancing items typically encapsulate the net result of the activities covered by the accounts in question and therefore include items of considerable economic interest and analytical significance, such as value added, disposable income and saving. There is also a strong link between the accounts and the balance sheets, as all the changes that occur over time in the assets or liabilities held by institutional units or sectors are systematically recorded in one or other of the accounts. In principle, the closing balance sheet is determined, or fully explained, by the opening balance sheet and the transactions or other events recorded in the sequence of accounts.

B. Accounts and Activities

3. Before summarising the sequence of accounts, it should be noted that although it is necessary to present the accounts in a particular order, the activities they describe should not be interpreted as taking place sequentially in time. For example, incomes are generated continuously by

processes of production, while expenditures on the outputs produced may also be taking place more or less simultaneously. An economy is a general equilibrium system in which interdependent economic activities involving countless transactions between different institutional units are carried out simultaneously. Feedbacks are continually taking place from one type of economic activity to another.

1. The sequence of accounts

a. The Production Account

4. The Production Account relates to the activity of producing goods and services as defined within the System. Its balancing item, gross value added, is defined as the value of output less the value of intermediate consumption and is a measure of the contribution to GDP made by an individual producer, industry or sector. Gross value added is the source from which the primary incomes of the System are generated and is therefore carried forward into the Primary Distribution of Income Account.

b. The income accounts

5. The income accounts consist of a set of articulated accounts showing how incomes are:

- generated by production;
- distributed to institutional units with claims on the value added created by production;
- redistributed among institutional units, mainly by government units through social security contributions and benefits and taxes;
- eventually used by households, government units or non-profit institutions (NPIs) for purposes of final consumption or saving.

6. The balancing item emerging from the complete set of income accounts is saving which is carried forward into the Capital Account. The income accounts have considerable intrinsic economic interest in themselves. They are needed to explain the basic economic activity of final consumption - that is, the use of the goods and services emanating from production for the satisfaction of the individual and collective needs and wants of households and the community.

c. The accumulation accounts

7. These accounts record the acquisition and disposal of financial and non-financial assets and liabilities by institutional units through transactions or as a result of other events:

- The Capital Account records acquisitions and disposals of non-financial assets as a result of transactions with other units or internal bookkeeping transactions linked to production (changes in inventories and consumption of fixed capital);

- The Financial Account records acquisitions and disposals of financial assets and liabilities, also through transactions;

- A third account records changes in the values of the assets and liabilities held by institutional units as a result of other factors, including changes in the prices of the assets during the course of the accounting period.

8. The link between the accumulation accounts and the income accounts is provided by the fact that saving must be used to acquire financial or non-financial assets of one kind or another, even if the asset is only cash. When saving is negative, the excess of consumption over income must be financed by disposing of assets or incurring liabilities. The Financial Account shows the way in which funds are channelled from one group of units to another, especially through financial intermediaries. Access to finance is typically a prerequisite for engaging in many types of economic activities.

d. The Balance Sheets

9. The Balance Sheets show the assets and liabilities of institutional units at the beginning and end of the accounting periods. As already noted, the levels of assets and liabilities at any moment of time vary automatically whenever any transactions, price changes or other changes affecting the volume of assets or liabilities held take place. These are all recorded in one or other of the accumulation accounts so that the difference between the values in the opening and closing Balance Sheets is entirely accounted for within the System, provided, of course, that the assets and liabilities recorded in the Balance Sheets are valued consistently with the transactions and other changes - that is, at current prices.

2. Activities and transactions

10. The accounts of the System are designed to provide analytically useful information about activities and processes taking place in the economy, such as production, consumption and the accumulation of assets. They do this usually by recording transactions between institutional units that are associated with these activities rather than by trying to record or measure

the physical processes directly. For example, the accounts do not record the physical consumption of goods and services by households - the food they eat or the fuel they burn within a given time period. Instead, they record the expenditures that households make on final consumption goods and services or, more generally, the values of the goods and services they acquire through transactions with other units, whether purchased or not. Data on transactions provide the basic source material from which the values of the various elements in the accounts are estimated. The use of transactions data has important advantages. First, the prices at which goods and services are exchanged in transactions between willing buyers and sellers on markets provide the information needed for valuing, directly or indirectly, all the items in the accounts. Second, a transaction that takes place between two different institutional units can be recorded for both parties to the transactions and therefore generally appears twice in the accounts. This enables important linkages to be established in the System. For example, output is obtained by summing the amounts sold, bartered or transferred to other units plus the amounts entered into, less the amounts withdrawn from, inventories including work-in-progress. In effect, the value of output is obtained by recording the various uses of that output by means of data on transactions. In this way, flows of goods and services can be traced through the economic system from their producers to their eventual users. Some transactions are only internal bookkeeping transactions that take place within a single unit, but the great majority of transactions take place between different units or markets.

C. The Sectors of the Economy

11. Two main kinds of institutional units, or transactors, are distinguished in the System - households and legal entities. The latter are either entities created for purposes of production, mainly corporations and NPIs, or government units including social security funds. Institutional units are essentially units that are capable of owning goods and assets, of incurring liabilities and of engaging in economic activities and transactions with other units in their own right. For purposes of the System, institutional units that are resident in the economy are grouped together into five mutually exclusive sectors composed of the following types of units:

- non-financial corporations;
- financial corporations;
- government units including social security funds;
- NPIs serving households;
- households.

The five sectors together make up the total economy. Each sector can also be divided into sub-sectors, if desired. The System makes provision for a complete set of accounts, including balance sheets, to be compiled for each sector, and sub-sector if desired, as well as for the total economy. The total number of accounts that may be compiled is therefore potentially quite large, depending upon the level of disaggregation that is required and

feasible. Only by disaggregation is it possible to observe the interactions between the different parts of the economy that need to be measured and analysed for purposes of policy making. The complete set of accounts at the level of the five main sectors is given in <chapter II, Overview>.

12. Institutional units that are resident abroad are grouped together to form the rest of the world. The System does not require accounts to be compiled in respect of economic activities taking place in the rest of the world, but all transactions between resident and non-resident units have to be recorded in order to obtain a complete accounting for the activities of resident units. Transactions between residents and non-residents are grouped together in a single account, the Rest of the World Account of the System.

D. Concepts and Classifications

13. The contents of the SNA depend not only on the accounting structure itself - that is, on the type and format of accounts distinguished - but also on the ways in which the items included in the accounts are defined and classified. The issues involved are not simply of a technical nature but raise fundamental questions of economic theory and principles. The concepts and classifications used in the System have a considerable impact on the ways in which the data may be used and the interpretations placed on them.

1. The production boundary

14. The activity of production is fundamental. In the System, production is understood to be a physical process, carried out under the responsibility and management of an institutional unit, in which labour and assets are used to transform inputs of goods and services into outputs of goods and services. The goods must be such that their ownership can be exchanged in transactions between institutional units while the services must be such that they can be provided by one unit to another. In other words, all goods and services produced as outputs must be capable of being sold or disposed of on markets if desired, while all goods and services consumed must be capable of being purchased or acquired on markets. The criterion of marketability is fundamental to the definition of both goods and services produced as outputs. The System therefore includes within the production boundary all production actually destined for the market, whether for sale or barter. It also includes all services provided free to individual households or the community by government units or NPIs.

15. The main problem for defining the range of activities recorded in the Production Accounts of the System is to decide upon the treatment of activities that produce goods or services that could have been supplied to others on the market but are actually retained by their producers for their own use. These include a very wide range of productive activities, in particular:

(1) the production of agricultural goods by households enterprises for own final consumption;

(2) the production of other goods for own use by households: the construction of dwellings, the production of foodstuffs and clothing, etc.;

(3) the production of housing services for own final consumption by owner occupiers;

(4) the production of domestic and personal services within households: cleaning, repairs, the preparation of meals, care and training of children, etc.

All these activities are productive. However, inclusion in the System is not simply a matter of estimating, or imputing, values for the outputs of these activities. It is also necessary to assign values to the corresponding consumption and the incomes generated by these activities. It is clear that the economic significance of these flows is quite different from that of monetary flows: for example, the incomes generated are not available to be spent on other goods and services but are tied to the consumption of the goods and services produced. The inclusion of large non-monetary flows of this kind in the accounts together with monetary flows can obscure what is happening on markets and reduce the analytic usefulness of the data.

16. The SNA is a multipurpose system designed primarily for purposes of economic analysis, decision taking and policy making. It is therefore necessary to strike a balance between the desire for the accounts to be as comprehensive as possible and the desire to prevent flows needed for the analysis of market behaviour and disequilibria from being swamped by imputed values relating to non-market activities. The System therefore includes all production of goods for own use within its production boundary, as goods can be switched between market and non-market use even after they have been produced, but excludes all production of services for own final consumption within households (except for the services produced by paid domestic staff and the own-account production of housing services by owner occupiers). These services are all consumed as they are produced and the links with market activities are much more tenuous than for goods production, such as agricultural goods which may be produced partly for own final consumption and partly for sale, or barter, on the market. The location of the production boundary in the System is therefore a compromise, but a deliberate one taking account of the needs of most users. In this context, it may be noted that in labour force statistics economically active persons are defined as those engaged in productive activities as defined in the SNA. If the production boundary were to include the production of personal and domestic services by members of households for their own final consumption, all persons engaged on such activities would be not merely in the labour force but classified as employed. Unemployment would become virtually non-existent by definition. This illustrates the need to confine the production boundary in the SNA to market activities or activities that are close substitutes for market

activities.

2. Other boundary problems

17. Certain natural processes may or may not be counted as production depending upon the circumstances in which they occur. A necessary condition for an activity to be treated as productive is that it must be carried out under the instigation, control and responsibility of some institutional unit that exercises ownership rights over whatever is produced. For example, the natural growth of stocks of fish in the oceans is not counted as production: the process is not managed by any institutional unit and the fish do not belong to any institutional unit. On the other hand, the growth of fish in fish farms is treated as a process of production in much the same way that rearing livestock is a process of production. Similarly, the natural growth of wild, uncultivated forests or wild fruits or berries is not counted as production, whereas the cultivation of crop-bearing trees, as trees grown for timber or other uses, is counted in the same way as growing annual crops. It should be noted, however, that the felling of trees in wild forests, and the gathering of wild fruit or berries, and also firewood, counts as production. Similarly, rainfall and the flow of water down natural water courses are not processes of production, whereas storing water in reservoirs or dams and the piping, or carrying, of water from one location to another all constitute production.

18. These examples show clearly that many activities or processes that may be of benefit to institutional units, both as producers and consumers, are not processes of production in an economic sense. Rainfall may be vital to the agricultural production of a country but it is not part of its GDP.

3. The consumption boundary

19. The coverage of production in the System has ramifications that extend considerably beyond the Production Account itself. The boundary of production determines the total value added produced and hence the total amount of incomes generated by production. The boundary of production also determines the boundary of consumption. In particular, the range of goods and services that are included in household final consumption expenditures, and actual consumption, is governed by the production boundary; for example, these expenditures include the estimated, or imputed, values of agricultural products produced by households for their own final consumption and also the values of the housing services produced for their own consumption by owner occupiers, but not the values of "do-it-yourself" repairs and maintenance to vehicles or household durables, the cleaning of dwellings or the care and training of children. Only the expenditures on goods utilised for these purposes - e.g., cleaning materials - are included in household final consumption expenditures.

4. The asset boundary

20. Balance Sheets are compiled for institutional units, or groups of units, and record the values of the assets owned by those units or the liabilities they have incurred. Assets as defined in the System are entities that must be owned by some unit, or units, and from which economic benefits are derived by their owners(s) by holding or using them over a period of time. Financial assets and fixed assets, such as machinery, equipment and structures which have themselves been produced as outputs in the past, are clearly covered by this definition. However, the ownership criterion is important for determining which naturally occurring - i.e., non-produced - assets are included in the System. Naturally occurring assets such as land, mineral deposits, fuel reserves, uncultivated forests or other vegetation and wild animals are included in the Balance Sheets provided that some institutional unit, or units, are exercising effective ownership rights over them - that is, are actually in a position to be able to benefit from them. The units need not be private and could be government units exercising ownership rights on behalf of entire communities. Thus, most environmental assets are included within the System. Assets that are not included are those such as the atmosphere or the high seas over which no ownership rights can be exercised, or mineral or fuel deposits that have not been discovered or that are unworkable - that is, incapable of bringing any benefits to their owners, given their situation and the technology available at the time to which the Balance Sheet relates.

21. Changes in the values of naturally occurring assets owned by institutional units between one Balance Sheet and others are recorded in one or other of the accumulation accounts of the System, depending upon the reason for the change. For example, the depletion of a natural asset as a result of its use in production is recorded there, and also losses of fixed assets due to their destruction by natural disasters (floods, earthquakes, etc.) Conversely, when new workable deposits or reserves of minerals or fuels are discovered, their appearance is recorded in one of the accumulation accounts and they enter the Balance Sheets in this way.

5. National boundaries

22. The accounts of the System are compiled for resident institutional units grouped into sectors and sub-sectors. The concept of residence is the same as that used in the Balance of Payments Manual of the IMF. An institutional unit is said to be resident within a given economy when it maintains a centre of economic interest in that territory: that is, when it engages, or intends to engage, in economic activities or transactions on a significant scale either indefinitely or over a long period of time, conventionally treated as one year for most purposes. The GDP of a country is therefore equal to the sum of the gross values added of all resident institutional units engaged in production as defined in the System (plus import duties and non-deductible VAT). This is not necessarily exactly the same as the sum of the gross values added of all productive activities taking place within the geographical boundaries of the

national economy. Some of the production of a resident institutional unit may take place abroad: for example, the installation of some exported machinery or equipment or a consultancy project undertaken by a team of expert advisers working temporarily abroad. Conversely, some of the production taking place within a country may be attributable to foreign institutional units. However, if a resident institutional unit continues to engage in production in another country over a long period of time it will usually be deemed to have acquired a centre of economic interest in that country. The unit engaged in production abroad will therefore be deemed to be a quasi-corporation resident in the country in which it operates, even if it does not have separate legal status in practice.

E. The Implementation of Concepts and Classifications

23. The contents of the System are greatly influenced by the ways in which certain concepts, definitions, distinctions and classifications are implemented in practice. A certain tolerance is often needed to avoid imposing unrealistic demands on the compilers of national accounts and also possibly to simplify the data from the point of view of users by avoiding esoteric complexities that might be created by attempting to implement certain theoretical constructs in an overly rigorous fashion. These points may be illustrated by considering two fundamental distinctions in the System: namely, the distinction between consumption and gross capital formation (or gross investment as it is often called in economics) and, within consumption, that between final and intermediate consumption.

1. Final consumption, intermediate consumption and gross capital formation

24. Consumption is an activity in which institutional units use up goods or services they have acquired through transactions or in other ways. There are two quite different kinds of consumption. Intermediate consumption consists of those goods or services that are entirely used up as inputs into processes of production within the accounting period. Final consumption consists of those goods and services that are used up during the accounting period by individual households or the community to satisfy their individual or collective needs or wants. The System also draws distinctions between expenditures by households on individual goods and services intended for final consumption, their acquisitions of such goods or services including those acquired through transfers as well as expenditures, and their eventual use of the goods and services to satisfy their needs and wants.

25. The activity of gross capital formation is mainly restricted to institutional units in their capacity as producers. Moreover, it is confined to assets produced as outputs from processes of production. Apart from valuables acquired as stores of value (precious metals and stones, works of art, etc.) gross capital formation has two main components:

- gross fixed capital formation: the value of acquisitions less

disposals of fixed assets, mainly machinery, equipment, buildings and other structures;

changes in inventories: the value of acquisitions less disposals of goods held in producers' inventories, including work-in-progress.

Fixed assets are assets (mostly, but not entirely, durable producer goods) that are used continuously in production over long periods of time (at least one year).

26. The general nature and purpose of the distinction between gross capital formation and consumption, whether intermediate or final, is clear. The distinction is fundamental for economic analysis and policy making. Nevertheless, there are many cases in which the borderline between consumption and gross capital formation is not so easy to locate in practice. There are also other cases in which certain activities, or transactions, contain some elements that correspond to consumption and others that resemble capital formation. In order to ensure that the System is implemented in a uniform way it is necessary to introduce some guidelines, or conventions, for the benefit of both compilers and users. Some important examples are given in the following paragraphs.

a. Repairs, maintenance and gross fixed capital formation

27. Repairs and maintenance have to be undertaken in order to maintain fixed assets, both machinery and structures, in good working order. The costs of ordinary maintenance and repairs undertaken by enterprises are classified as intermediate consumption; those by households or dwellings, or government on roads, for example, are classified as final consumption. However, major improvements, additions or extensions to existing fixed assets may also be undertaken which improve the performance of the assets, increase their capacity or prolong their expected working lives. Such improvements, additions or extensions are classified as gross fixed capital formation.

28. In practice, it is not easy to draw the line between ordinary repairs or maintenance undertaken and major improvements and additions. The System is able to provide only very general intuitive guidelines about how to distinguish one from the other. If repairs and maintenance are neglected, many kinds of fixed assets may deteriorate rapidly and perhaps irreversibly, but such deterioration is not recorded as negative gross fixed capital formation. Some analysts consider that the distinction between ordinary repairs and maintenance and major improvements and additions is neither operational nor defensible from a theoretical, analytic and policy viewpoint. They would favour a more "gross" method of recording in which all such activities are treated as gross fixed capital formation.

b. Training, research and development

29. Expenditures by enterprises on activities such as staff training or research and development are not determined primarily by the rate at which production is carried out in the current period but are designed to raise productivity or increase the range of production possibilities in the future, in much the same way as expenditures on machinery, equipment, buildings and other structures. However, expenditures on training and research or development do not generally lead to the creation of assets that can be easily identified, quantified and valued for balance sheet purposes. For this reason, such expenditures continue to be classified as intermediate consumption even though it is recognised that they are undertaken for the purpose of trying to secure future benefits. In fact, there are many other expenditures that may be expected to have impacts in future periods as well as the current period: for example, market research, advertising and expenditures on health, safety and restaurant facilities that affect the morale, well being and attitudes of the work force. The concept of gross capital formation used in the System needs to be much more precise. It implies the acquisition of assets over which ownership rights can be established and which bring quantifiable economic benefits whose values can be recorded in the Balance Sheets of their owners. To record certain types of expenditure such as gross capital formation in the Capital Account of an integrated system such as the SNA, it is necessary to be able to follow through, at least conceptually, with a complete accounting for the consequential assets not only in the current accounting period but also in future periods.

c. Education

30. It is often proposed that expenditures on education should also be classified as gross fixed capital formation as a form of investment in human capital. The acquisition of knowledge, skills and qualifications increases the productive potential of the individuals concerned and is a source of economic benefit to them. However, education assets in the form of knowledge, skills and qualification are not fixed assets as understood in the System. They are not produced assets but are acquired through learning, studying and practising, activities that are not themselves processes of production. The education services produced by schools, colleges, universities, etc. are not assets: they are consumed by students in the process of their acquiring knowledge and skills. Whatever education assets may ensue are embodied in individuals as persons. They cannot be transferred to others and cannot be shown in the Balance Sheets of the owners of the enterprises in which the individuals work (except in very rare cases when certain highly skilled individuals are under contract to work for particular employers for specified periods). Education assets could possibly be shown in Balance Sheets for the individuals in which they are embodied, but they could not be equated with fixed assets as individuals are not enterprises engaged in production. If they were to be shown, the assets would be difficult to value, bearing in mind that the remuneration paid to a skilled worker depends upon the amount of time

and effort expended and is not simply a return payable to the owner of an asset.

31. Thus, while knowledge, skills and qualifications can be regarded as "assets" to the individuals possessing them, they do not fall within the asset boundary of the System and lack several of the essential characteristics of fixed assets. In any case, expenditures on services produced by educational establishments must be treated as consumption expenditures and could not be treated as expenditures on fixed assets. Finally, it may be noted that education services do satisfy human needs and wants directly - they are not consumed purely to increase people's productivity - and they are not the only services consumed by individuals to bring long as well as short term benefits. For example, the consumption of health services brings long term benefits and even the consumption of basic items such as food and housing is necessary in order to keep an individual in good health - or good working order.

2. The distinction between consumption and gross capital formation

32. The examples given in previous paragraphs are not intended to show that items such as education and research and development really are "used up" in the periods in which they are recorded as being produced and consumed, but to show that a dichotomy between consumption and gross capital formation is an over-simplification that inevitably presents problems when dealing with flows of goods and services, and the corresponding expenditures, that contain elements of both. The issue is not simply whether to classify certain flows as consumption or capital formation, but how to achieve an economically meaningful and feasible set of accounting procedures for the assets built up by the capital formation within an integrated, coherent set of accounts encompassing past and future periods as well as the present.

33. In using the accounts, it follows that the significance of the distinction between consumption and gross capital formation should not be exaggerated. For example, goods and services acquired by households for the satisfaction of their needs or wants and recorded under household actual consumption are not suddenly "used up" at the moment of acquisition. In particular, households "consuming" services such as health and education may continue to derive benefits over long periods of time. The "consumption" of such services has therefore some points in common with the acquisition of assets. Similarly, enterprises may continue to benefit over long periods of time from the intermediate consumption of services such as maintenance and repairs, training, research and development, market research and so on. Thus, while the acquisition of fixed assets by enterprises - that is, gross fixed capital formation - may be expected to enhance future production possibilities, many other types of expenditure that do not lead to acquisition of identifiable, tradeable assets may also be expected to bring future benefits as well.

34. The decision whether to classify certain types of expenditure by households or government, such as education or health services, as final

consumption expenditures or gross fixed capital formation does not affect the size of GDP, as both are final expenditures. On the other hand, the decision to classify certain expenditures by enterprises as intermediate consumption rather than gross fixed capital formation does reduce the gross value added and operating surplus of the enterprise and hence GDP as a whole. However, treating certain expenditures as intermediate tends to reduce not only gross fixed capital formation in the current period, but also consumption of fixed capital in respect of gross fixed capital formation undertaken in previous periods. It is, therefore, an open question as to how net value added and net domestic product (NDP) are affected, depending upon the pattern of the relevant expenditures over time.

F. Links with Economic Theory

35. The accounting rules and procedures used in the System are based on those used in business accounting. For example, the traditional double entry bookkeeping principle whereby a transaction gives rise to a pair of matching debit and credit entries within the accounts of each of the two parties involved in a transaction is strictly followed in economic or national accounting. For example, recording the sale of a unit of output requires not only an entry in the Production Account of the seller but also an entry of equal value in the seller's Financial Account to record the cash, or short-term financial credit, received in exchange for the output. As two entries are also needed for the buyer, a transaction of this kind actually gives rise to four simultaneous entries in a system of macro-economic accounts covering both the seller and the buyer. These multiple entries enable the economic interactions between different institutional units and sectors to be recorded and analysed.

36. However, the design and implementation of the System draws heavily on economic theory and principles as well as business accounting practices. Basic concepts such as production, consumption, and capital formation are meant to be rooted in economic theory. When business accounting practices come into conflict with economic principles, priority is given to the latter, bearing in mind that the System is designed for purposes of economic analysis and policy making. This is best illustrated by the concept of cost of production used in the System.

37. Business accounts commonly (but not invariably) record costs on an historic basis. Historic cost accounting requires goods or assets used in production to be valued by the expenditures actually incurred to acquire those goods or assets however far back in the past those expenditures took place. In the System, however, the concept of opportunity cost as defined in economics is employed. In other words, the cost of using, or using up, some existing asset or good in one particular process of production is measured by the amount of the benefits that could have been secured by using the asset or good in alternative ways. Opportunity cost is calculated with reference to the opportunities foregone at the time the asset or resource is used, as distinct from the costs incurred in the past to acquire the asset or good. The best

practical approximation to opportunity cost accounting is current cost accounting whereby assets and goods used in production are valued at their current market prices at the time the production takes place. Current cost accounting is sometimes described as replacement cost accounting, although there may be no intention of actually replacing the asset or goods in question after it has been used.

38. When there is persistent inflation, even moderate inflation, the use of historic costs tends to underestimate the costs of production from an economic point of view. Thus, the historic cost profit earned on production may be much greater than the operating surplus from production as defined in the System. Profits at historic costs are liable to give very misleading signals as to the profitability of the production processes to which they relate by systematically undervaluing inputs compared with outputs.

39. Current cost accounting has ramifications that permeate the entire System. It affects all the accounts and balance sheets and their balancing items. A fundamental principle underlying the measurement of gross value added, and hence GDP, is that output and intermediate consumption must be valued at the prices current at the time the production takes place. This implies that goods entering and leaving inventories held by producers must be valued at the prices prevailing at the times the entries or withdrawals take place. This method of recording changes in inventories is not one that is commonly used in business accounting, however, and may sometimes give very different results - especially when inventory levels fluctuate during the accounting period. Similarly, consumption of fixed capital in the System is measured on the basis of the estimated costs of using the assets valued at the time they are used as distinct from the time they were acquired. When there is persistent inflation, consumption of fixed capital as measured in the System is therefore liable to be much greater than depreciation at historic costs even if the same assumptions are made in the System and in business accounts about the lengths of the lives of the assets and their rates of wear and tear and obsolescence. To avoid confusion, therefore, the term "consumption of fixed capital" is deliberately used in the System instead of "depreciation", just as the term "operating surplus" is used instead of "profit" or "operating profit".

40. Measuring consumption of fixed capital at current costs is equivalent to measuring the operating surplus from production after maintaining intact the stock of fixed assets valued at current prices. Even if the fixed assets used up during the accounting period are not actually replaced, the amount of consumption of fixed capital charged as a cost of production should be sufficient to enable the assets to be replaced, if desired. Similarly, the concept of income used in the System is based on the underlying idea that it represents the maximum amount available to households or other units for purposes of consumption after maintaining their net worth intact, i.e., their assets minus their liabilities valued at current prices - in this context, the average prices of the assets during accounting period. The System does not include in income any amounts resulting from redistributions of wealth that take place because of capital transfers between units or real holding, or

capital, gains or losses on assets or liabilities due to changes in their relative prices. At a macro level, the aggregate income of a group of units is not changed by redistributing wealth within the group, and the System defines income in such a way as to ensure that redistributions of wealth through capital transfers and real holding gains or losses do not enter into income at a micro level by recording such transfers, gains or losses in the accumulation accounts and not in the income accounts.

1. Micro-macro links

41. Given that the sequence of accounts and balance sheets of the System can, in principle, be compiled at any level of aggregation, including that of an individual institutional unit, it would be desirable if the macro-economic accounts for sectors or the total economy could actually be obtained directly by aggregating corresponding data for individual units. There would be considerable analytical advantages in having micro databases that are fully compatible with the corresponding macroeconomic accounts for sectors or the total economy. In general, data in the form of aggregates or averages may conceal a great deal of useful information about changes occurring within the population to which they relate. For example, changes in the size of distribution of income may have an impact on consumer behaviour over and above any impact due to changes in the aggregate or average level of incomes recorded in the accounts of the System. Information relating to individual units may be needed not only to obtain a better understanding of the working of the economy but also to be able to monitor the impact of government policies, or other events, on selected types of units about which there may be special concern, such as households with very low incomes. Micro data sets also make it possible to follow the behaviour of individual units over time. Given the enormous improvements in computers and communications that have occurred over the last two decades and that may be expected to continue, the management and analysis of very large micro databases is becoming increasingly easy from the technical side. Data can also be derived from a variety of different sources, such as administrative and business records, as well as specially conducted censuses and surveys.

42. In practice, however, it is unrealistic to envisage macro-economic accounts being built up by simply aggregating the relevant micro-data. The first problem is that even when individual institutional units keep accounts or records the concepts that are needed and used at a micro level may not be suitable at a macro level. Individual units may be obliged to use concepts designed for other purposes, such as taxation. The accounting conventions and valuation methods used at a micro level typically differ from those required by the System. For example, as already noted, the widespread use of historic cost accounting means that the accounts of individual enterprises may differ considerably from those used in the System. In addition, depreciation as calculated for tax purposes may be quite arbitrary and yield numbers that are unacceptable from an economic view point. In such situations, it may be quite impractical to try to adjust the individual accounts of thousands of enterprises before aggregating them. It may be much easier to make global

adjustments to the data after they have already been aggregated, but in this case the macro data cease to be fully compatible with the underlying micro data. When the micro data are not derived from administrative records but from censuses or surveys designed for statistical purposes, the concepts used may be closer to those required, but the results may still require adjustment at a macro level because censuses or surveys are not always comprehensive in coverage (being confined to enterprises above a certain size, for example) and may also be subject to bias from response errors.

43. Households are unlikely to keep any accounts of the kind needed by the System. When micro-data are compiled for households they are typically derived from sample surveys that may also be subject to significant response and reporting errors. It is particularly difficult to obtain reliable and meaningful data about the activities of small unincorporated enterprises owned by households. While household surveys are an important source of data for macroeconomic accounts, the aggregates obtained from such surveys may have to be adjusted for certain typical biases, such as the under-reporting of certain types of expenditure (on tobacco, alcoholic drink, gambling, etc.) and also to make the aggregates consistent with macro data from other sources, such as imports. Another factor to be taken into account is the increasing opposition among the general public in many countries to the existence and maintenance of micro databases because of concern about lack of confidentiality and possible misuse of such databases. There is even strongly increasing opposition to the conduct of simple population censuses that have been readily accepted in the past.

44. It may be concluded therefore that, for various reasons, it may be difficult, if not impossible, to achieve micro databases and macro-economic accounts that are fully compatible with each other in practice. Nevertheless, it is clear that, as a general objective, the concepts, definitions and classifications used in economic accounting should, so far as possible, be the same at both a micro and macro level to facilitate the interface between the two kinds of data to the maximum extent possible.

G. The Aggregates of the System as Indicators Economic Activity and Welfare

1. Introduction

45. The SNA consists of a consistent, coherent set of macro-economic accounts, balance sheets and tables. It is essentially a complete system containing numerous flow and stock variables used for a variety of different analytic and policy purposes. Nevertheless, certain key aggregates of the System, especially GDP and GDP per head of population, have acquired an identity of their own and they are widely used by analysts, politicians, the press, the business community and the public at large as summary, global indicators of economic activity, independently of the rest of the System. Movements of such aggregates, and their associated price and volume measures, are used to evaluate the overall performance of the economy and hence to judge

the relative success or failure of economic policies pursued by governments. Movements in the volume of GDP per head over time are also used as indicators of changes in living standards and welfare between countries, or between different regions of the same country. The purpose of this section is to examine the validity of using the main aggregates of the System as indicators of economic activity and of welfare.

46. There are two aspects that need to be distinguished. The first is the adequacy of the main aggregates of the System as summary indicators of economic activities taking place within the economy as a whole. The second is the more general question of the validity of using measures of aggregate production or consumption as indicators of welfare. These two aspects are considered separately below.

2. The coverage of GDP and the role of imputations

47. In order to understand the System, a clear distinction must be drawn between activities such as production and consumption taking place in the economy and the transactions associated with those activities that are recorded in the accounts. Transactions are interactions between institutional units of a kind which can take place on markets: for example, the exchange of ownership of a good or fixed asset. The physical process by which such a good or fixed asset is produced is quite separate from a transaction in which it is sold or supplied to another unit. The transaction need not even take place in the same accounting period, and indeed may never take place if the producer decides to retain the good or asset for own consumption or gross capital formation.

48. When goods and services produced as outputs are sold in monetary transactions, their values are automatically included in the accounts of the System. Many goods or services are not actually sold but are nevertheless supplied to other units: for example, goods or services may be bartered for other goods or services or provided free as transfers in kind. Such goods and services are included in the accounts in the same way as goods and services sold in monetary transactions, except that their values are not given by the amounts paid for them and must be estimated. It is common to describe the values of the goods and services involved in these non-monetary transactions as being "imputed". However, the outputs themselves are certainly not imputed. On the contrary, the outputs are produced by activities that are no different from those used to produce goods or services for sale. Moreover, the transactions in which the goods and services are supplied to other units are genuine transactions between different institutional units even though the sellers do not receive money in exchange. It is therefore incorrect to describe the output itself as being imputed, merely because its monetary value must be estimated. For example, the output of financial intermediaries for which no direct charges are made is not imputed in the System. However, the value of such output has to be estimated.

49. When goods or services are produced for own use, however, no

transactions with other units take place. In such cases, in order to be able to record the goods or services in the accounts it is necessary to postulate the occurrence of internal transactions whereby producers allocate the goods or services produced for purposes of their own. In these cases the productive activities may be no different from those used to produce goods or services for sale, but it is necessary to impute the occurrence of an internal transaction as well as estimating values for the goods and services involved. Nevertheless, as in the case of non-monetary transactions between units, the goods and services produced as outputs are evidently not themselves imputed.

50. It is important therefore to understand the precise significance of "imputations" in the System. Imputations are needed in order to be able to include in the accounts productive activities whose outputs are not disposed of in monetary transactions with other units. Imputations should therefore not be interpreted as introducing hypothetical activities or flows of goods and services into the System. The purpose of imputations is simply to capture in the accounts those outputs from processes of production that are not sold in monetary transactions. Failure to impute values would mean that major flows of goods and services in the economy would be omitted from the accounts. In order to obtain aggregate measures that are fully comprehensive, therefore, values have to be imputed for <u>all</u> outputs of goods and services that are not sold in monetary transactions, whether produced for own use or not.

51. In practice, the System does record all outputs, but with one major exception already noted, namely outputs of domestic and personal services produced by members of households for themselves or other members of the same household. GDP is therefore intended to be a comprehensive measure of the total gross value added produced by all resident institutional units, subject to this one major exception. The reasons for excluding the own-account production and consumption of domestic and personal services within households were explained earlier.

52. GDP is, of course, confined to outputs produced by economic activities that produce goods or services that can be supplied to other units and whose production is capable of being organised on a market basis. Production in an economic sense does not cover all activities that require the expenditure of time and effort by persons: for example, activities such as eating, drinking or sleeping that cannot be performed by one person for another. Consistently with this principle, the activity of studying and learning by pupils and students also does not qualify as production, as already noted. Pupils and students are the final <u>consumers</u> of outputs of educational services produced by teachers and educational establishments.

53. As GDP is intended to provide a comprehensive measure of the total gross value added produced by resident enterprises, changes in its volume should provide a good indicator of changes in the general level of economic activity both in the short and the long term. However, changes in the volume of GDP, or GDP per head, cannot necessarily be equated with changes in welfare.

3. Changes in welfare

54. In a market economy, the prices used to aggregate the values of goods and services should reflect not only their relative costs of production but also the relative benefits which their users expect to derive from using them for production or consumption. Thus, there should be a strong link between changes in aggregate production and consumption and changes in welfare. However, changes in the volume of consumption cannot be identified with changes in welfare directly. The distinction between changes in the quantity of some good or service and the utility derived from consuming it is clear enough at the level of an individual good or service. For example, the change in the quantity of sugar consumed by households is measured directly in physical units without reference to any change in satisfaction that the households may or may not derive from consuming it. Similarly, aggregate volume measures that are constructed from information about the proportionate changes in the quantities of a group of goods or services also need to be distinguished from associated changes in welfare. There are several reasons why the two may diverge from each other.

a. Interaction with non-economic factors

55. Welfare in a broad sense depends on non-economic factors as well as the amount of goods and services consumed. For example, people's welfare also depends on political factors such as their freedom and the amount of protection they are provided against various kinds of threats to their security, whether from inside or outside the country in question. Obviously, an economic indicator such as GDP is not intended to capture changes in welfare due to non-economic events such as political revolutions, wars, natural disasters or epidemics.

56. Consider the effects of an exceptionally severe winter combined with an influenza epidemic. In these circumstances, the production and consumption of a number of goods and services may be expected to rise in order to combat the effects of the cold and the epidemic: for example, the production and consumption of electricity and other fuels, clothing, and medical services will tend to increase. As compared with the previous year, people may consider themselves to be worse off overall because of the exceptionally bad weather and the epidemic, notwithstanding the fact that production and consumption may have increased in response to the additional demand for heating and health services. Thus, total welfare may fall even though GDP may increase in volume terms.

57. This kind of situation in no way invalidates the use of GDP as an indicator of welfare. In order to see how welfare varies with production and consumption it is necessary to hold other things equal. It is necessary to compare the welfare of a community with and without the additional goods and services, ceteris paribus. Given the occurrence of the cold and the epidemic, the community presumably finds itself much better off as a result of the extra production and consumption of heating and health services.

58. In general, there may be a tendency for production to rise to combat the harmful effects of events that reduce people's welfare in a broad sense. For example, production may increase in order to repair the damage caused by natural disasters such as earthquakes, hurricanes and floods. Once the disaster has occurred, the extra production may be expected to increase welfare. On the other hand, the damage caused by such disasters does not reduce GDP as it is not a cost of production. The occurrence of the damage is not dependent on whether or not any production is taking place. Thus, in itself, a natural disaster may well led to an increase in GDP by creating extra demands, even though the community may be no better off than in the previous period if the loss of welfare caused by the disaster exceeds the increase in welfare from the extra production and consumption.

(i) Man-made disasters

59. GDP may be expected to rise in response to man-made disasters as well as natural disasters. In particular, the production and consumption of goods and services typically rises as a result of wars. The same reasoning applies as for natural disasters. Given that a state of war exists, any consequential increase in the production and consumption of defence services may well increase welfare by affording extra protection to the community. Whether such increased welfare is sufficient to compensate for the loss of welfare caused by the war itself is quite another matter. The loss of lives and destruction of property due to enemy action is neither a cost of production nor negative capital formation. The destruction of assets due to military action has, of course, to be recorded in the System, but it appears in Other Changes in the Volume of Assets Account. It does not appear in the Production Account or any other account based on transactions.

60. The fact that the volume of GDP may increase as a result of the outbreak of war when the consumption of individual goods and services by households may be falling is sometimes interpreted as exposing a deficiency in the concepts of the System. It can be argued that collective defence services should be classified as intermediate rather than final so that increased consumption of defence services would not increase GDP. While this argument has some intuitive appeal, the fact remains that GDP is a measure of output and not welfare. The total amount of production taking place in the economy is undoubtedly increased by the increased expenditures on collective defence services, even though most people might prefer the output to be used for other purposes if there was no war.

61. Similar considerations arise with respect to so-called "regrettable necessities" in general. When increased production and consumption is needed in order to compensate for the loss of welfare created by damage or "bads" that did not previously exist, the community may be no better off than before the damage occurred. However, this should not be allowed to obscure the fact that without the extra production and consumption the community would actually be worse off. The extra production and consumption, per se, actually increases welfare. In general, final goods and services are consumed by

households to satisfy their needs and wants. The fact that some of these needs or wants may be created or increased by factors or events over which households have little or no control - bad weather, natural disasters, pollution and so on - in no way diminishes the benefits and welfare derived from consuming the goods and services in question. Quite ordinary consumer goods such as food and drink could be characterised as "regrettable necessities" which merely satisfy the recurrent basic needs of hunger and thirst without leaving the individuals any better off than before the onset of the hunger and thirst.

62. GDP cannot be said to be deficient as an indicators of welfare because it does not reflect losses of welfare that are not attributable to production - losses due to events such as natural disasters, wars, etc. However, damages to third parties caused by production processes themselves should, in principle, be recorded as costs of production, even when the costs are not borne financially by the producers that create the damage: for example, damages to others caused by pollution resulting from leakages of oil or gas from producers' establishments. However, it is not feasible for such costs to be attributed to the individual producers in question in the System when they do not in fact bear the costs under the legal system and institutional framework under which the production is actually carried out. To the extent that costs of production go unrecorded, value added itself is exaggerated and for this reason GDP may suffer as an indicator of welfare.

b. Other factors affecting welfare

63. Welfare depends upon the distribution of income and wealth within a community as well as on its total income and wealth. The importance of distribution has always been recognised in economics. Aggregate indicators such as GDP do not reflect any changes in distribution that may be taking place over time, so that such indicators need to be supplemented by micro-data for purposes of analysing changes in welfare.

64. It is also necessary to take account of the domestic and personal services produced for own consumption within households that are excluded from GDP. The benefits derived from such services are presumably quite large in most countries and must make a substantial contribution to welfare. In the short run, the amounts of such services produced and consumed are not likely to vary much, so that changes in welfare attributable to changes in total production and consumption in the economy are likely to be dominated by the activities covered by GDP. Over the longer run, however, there may be significant shifts in the balance between household service production and GDP production so that, for welfare purposes, the central accounts of the System may need to be supplemented by satellite accounts relating to household activities. Such accounts are essentially macro accounts and may themselves need to be supplemented by micro data.

c. Welfare, economic analysis and policy making

65. Although movements in GDP and other aggregates for the total economy can be extremely useful as indicators of both changes in activity in the economy and welfare, it must be remembered that the calculation of such aggregates is not the main reason for compiling national accounts. The SNA is an integrated system of accounts embracing different kinds of institutional units and sectors. It is intended for purposes of economic analysis, decision taking and policy making. It is a multipurpose system designed to meet the requirements of different kinds of users: governments, businesses, research institutes, universities, the press and the general public. No single user, or group of users, can take priority over all others. The use of the aggregates to measure changes in welfare is one of the most important uses of the System but only one. The System is primarily intended to provide disaggregated data to meet the needs of analysts and policy makers interested in the behaviour of markets and the factors responsible for major disequilibria such as inflation and unemployment. The design of the System and its coverage of economic activities has to be a compromise intended to yield the maximum benefits to users of all kinds and may not therefore be ideally suited for any one purpose taken in isolation.